

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
6 December 2001 (06.12.2001)

PCT

(10) International Publication Number  
**WO 01/92135 A1**

(51) International Patent Classification<sup>7</sup>: **B65D 85/48**,  
85/00, 85/02, A45C 13/10

(21) International Application Number: PCT/US01/15020

(22) International Filing Date: 9 May 2001 (09.05.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/202,585 9 May 2000 (09.05.2000) US  
60/217,656 10 July 2000 (10.07.2000) US  
09/851,499 8 May 2001 (08.05.2001) US

(71) Applicant (for all designated States except US): **FLU-  
ORWARE, INC.** [US/US]; 3500 Lyman Boulevard,  
Chaska, MN 55318 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BORES, Gregory,**

**W.** [US/US]; 16611 Lyons Avenue SE, Prior Lake, MN  
55372 (US). **ZABKA, Michael, C.** [US/US]; 75 Edge-  
wood Court, Barron, WI 54812 (US). **HENDERER,  
Ralph** [US/US]; 1515 Knob Hill Lane, Excelsior, MN  
55331 (US).

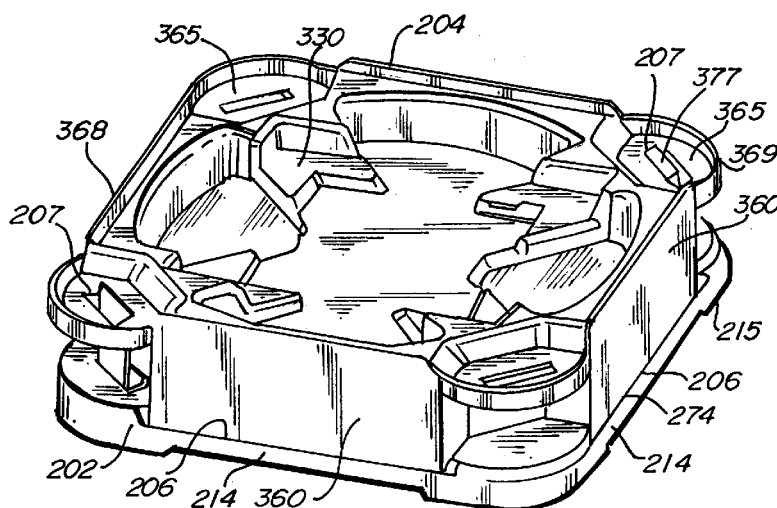
(74) Agents: **CHRISTENSEN, Douglas, J.** et al.; Patterson,  
Thunte, Skaar & Christensen, P.A., 4800 IDS Center, 80  
South 8th Street, Minneapolis, MN 55402-2100 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,  
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,  
MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,  
TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian  
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European  
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,  
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,  
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: SHOCK RESISTANT VARIABLE LOAD TOLERANT WAFER SHIPPER



(57) Abstract: A wafer shipper (202, 204) for stacked wafers (510) provides significantly improved resistance to shock and impact as well as flexibility and tolerance in wafer capacities and guidance in optimal amount of packing material. These characteristics are provided by unique structural configurations that provide rigidity and desirable distribution of impact forces. The shipper (202, 204) has a base (202) and a top cover (204) both of which have a nominal wall that primarily forms all of the features of the respective components. The base (202) has four sides (214), four corners, and arcuate wall segments (208) defining a wafer stack pocket. The sides are formed of a downwardly extending nominal wall portion (216, 218, 200) and an upwardly extending lip (274). Both adjoin a nominal wall defining a planar surface (210) that extends around the base (202) and forms a seat for the top cover (204). A feature and advantage of particular embodiments of the invention is the unique form fit whereby impact forces that are received on the corners and/or sides of the top cover (204) are transferred to the base (202) through the top cover (204) to upright portions on the opposite side of the base (202) from where the impact occur.



WO 01/92135 A1



**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*